FIG._1A

Light diffraction on grating

Air

Incident wave

30

Reflected waves

n=0   1   2
-1

CD - critical dimension

H - height

SWA - sidewall angle

Film stack above the grating

SWA

CD

H

film stack

Substrate

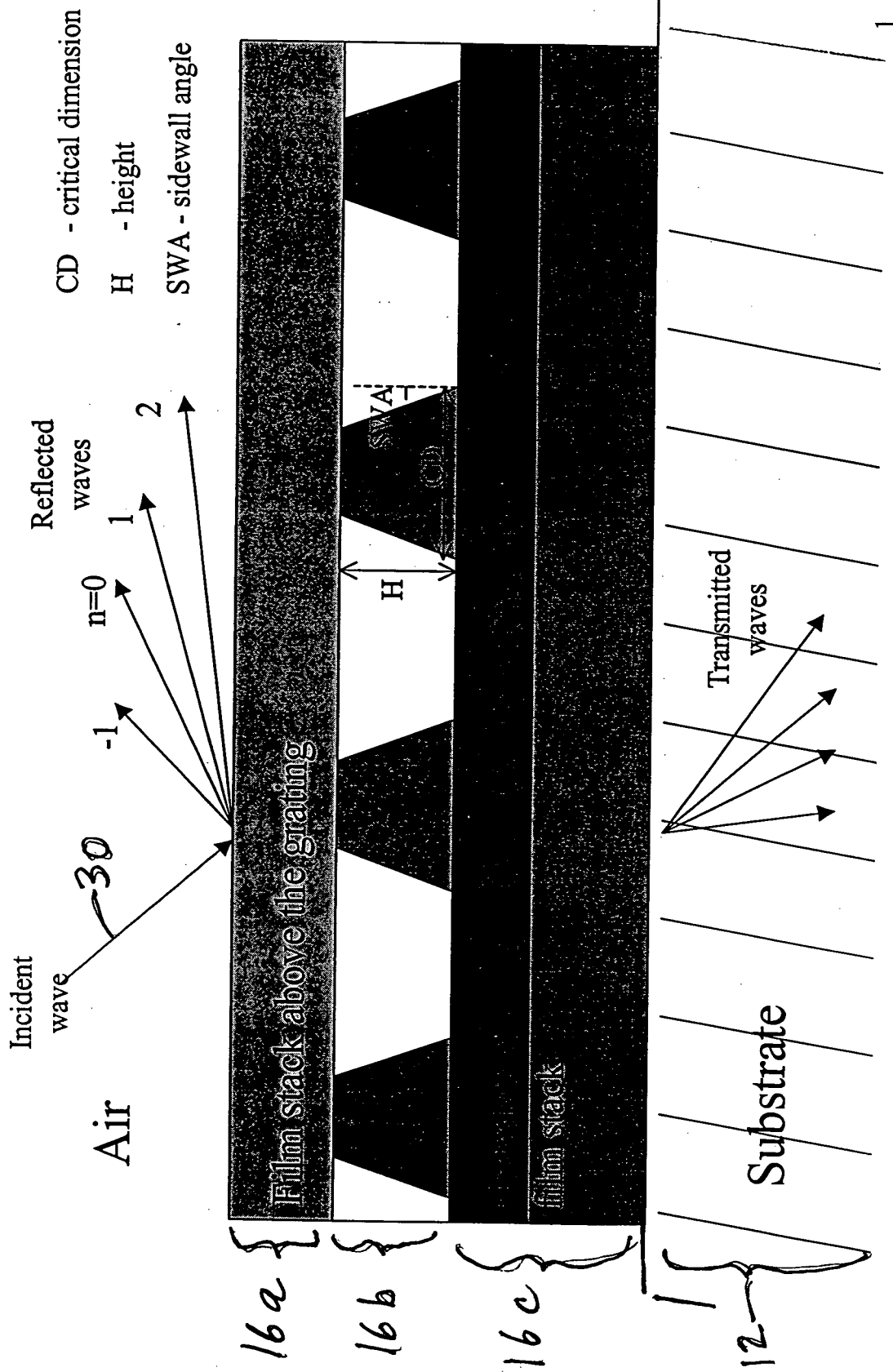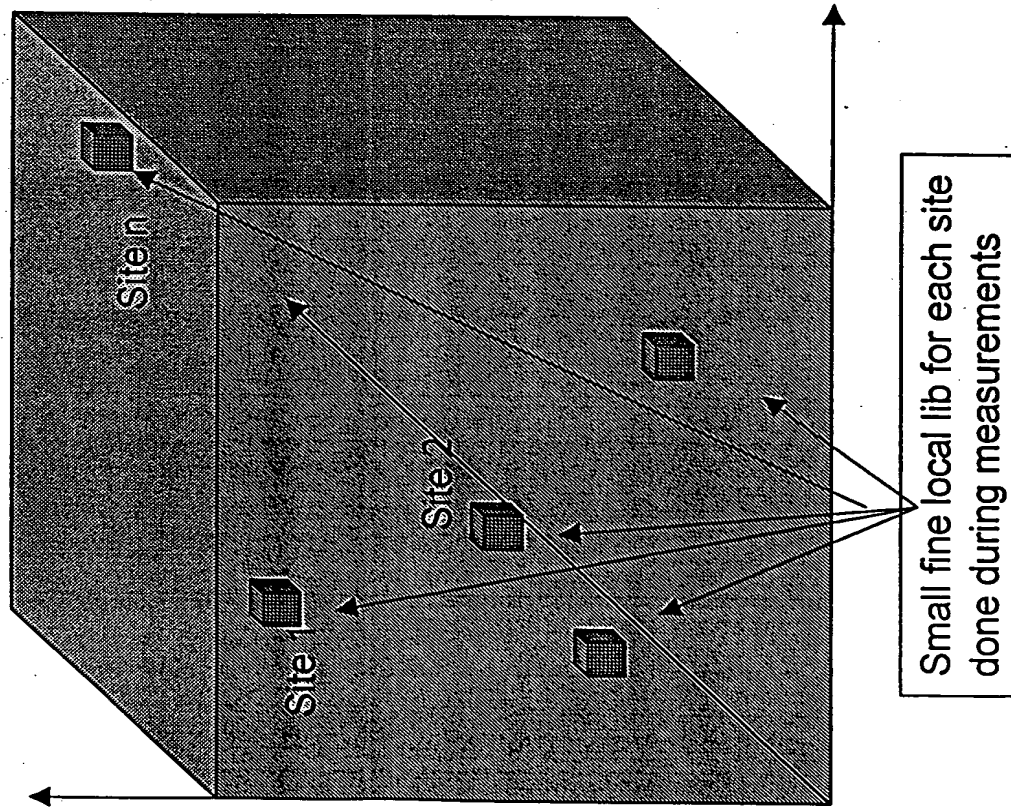Transmitted waves

16a

16b

16c

12

18

1

FIG. 1B

FIG.2

Adaptive library generation:
Minimize unused library grids for maximum efficiency

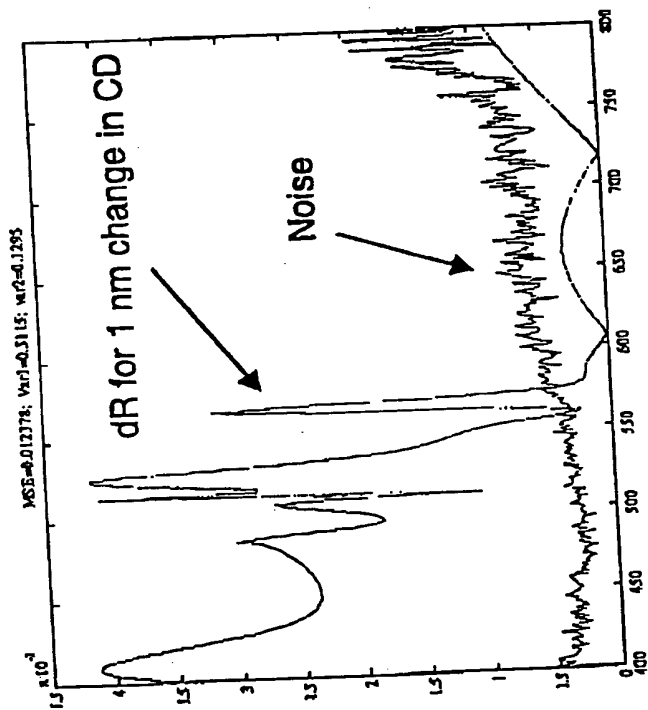Large coarse Lib to cover whole range
Done before measurements

Site n

Site 2

Site 1

Small fine local lib for each site
done during measurements

FIG. 3

FIG. 4

Calculation of S-matrix for the top film stack — 154

Calculation of the grating S-matrix — 152
- Find solution in each slab
- S-matrix propagation within the grating
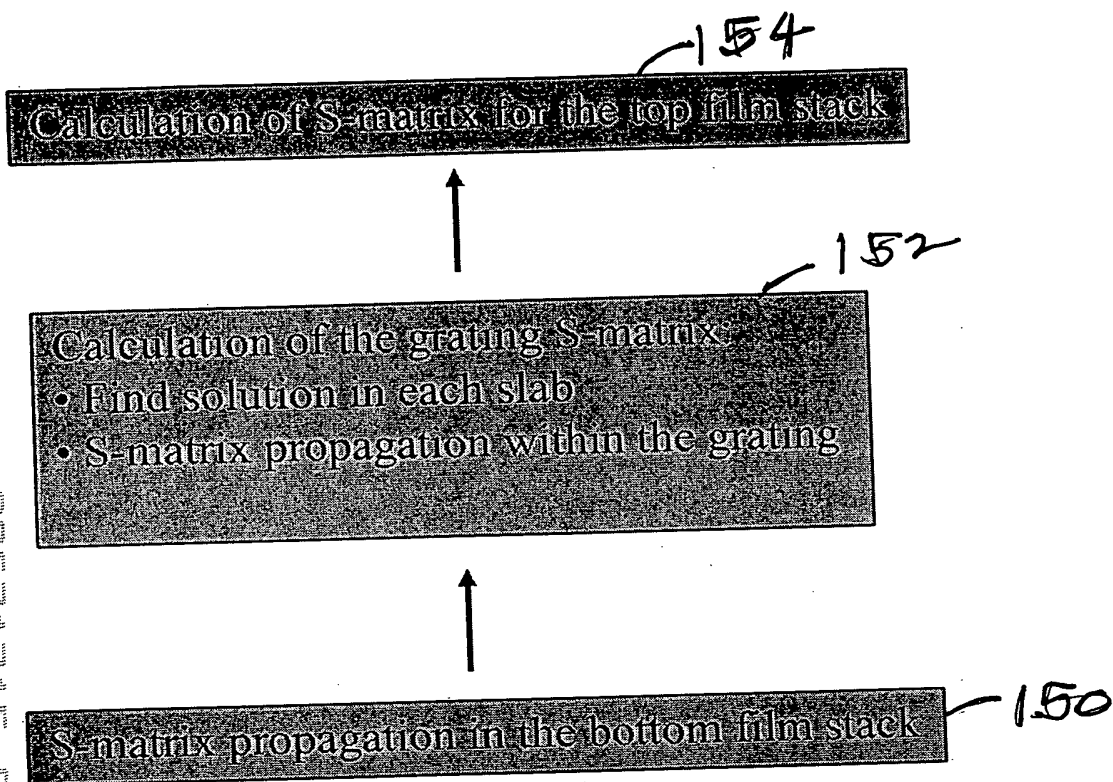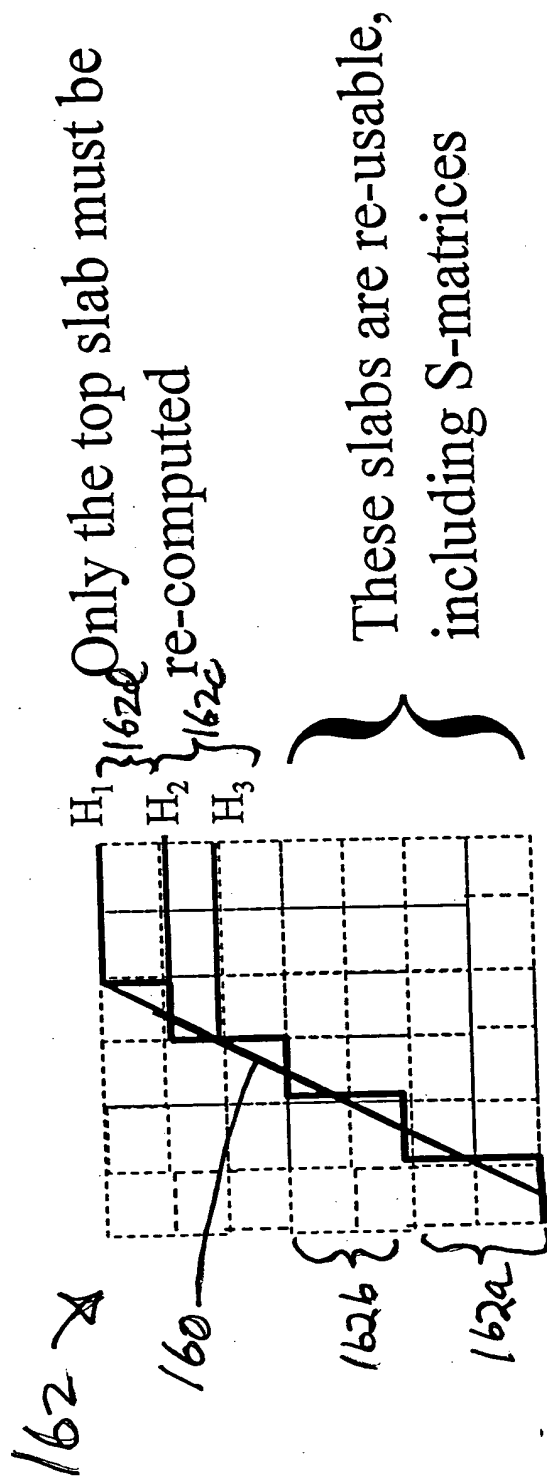
S-matrix propagation in the bottom film stack — 150

FIG. 5

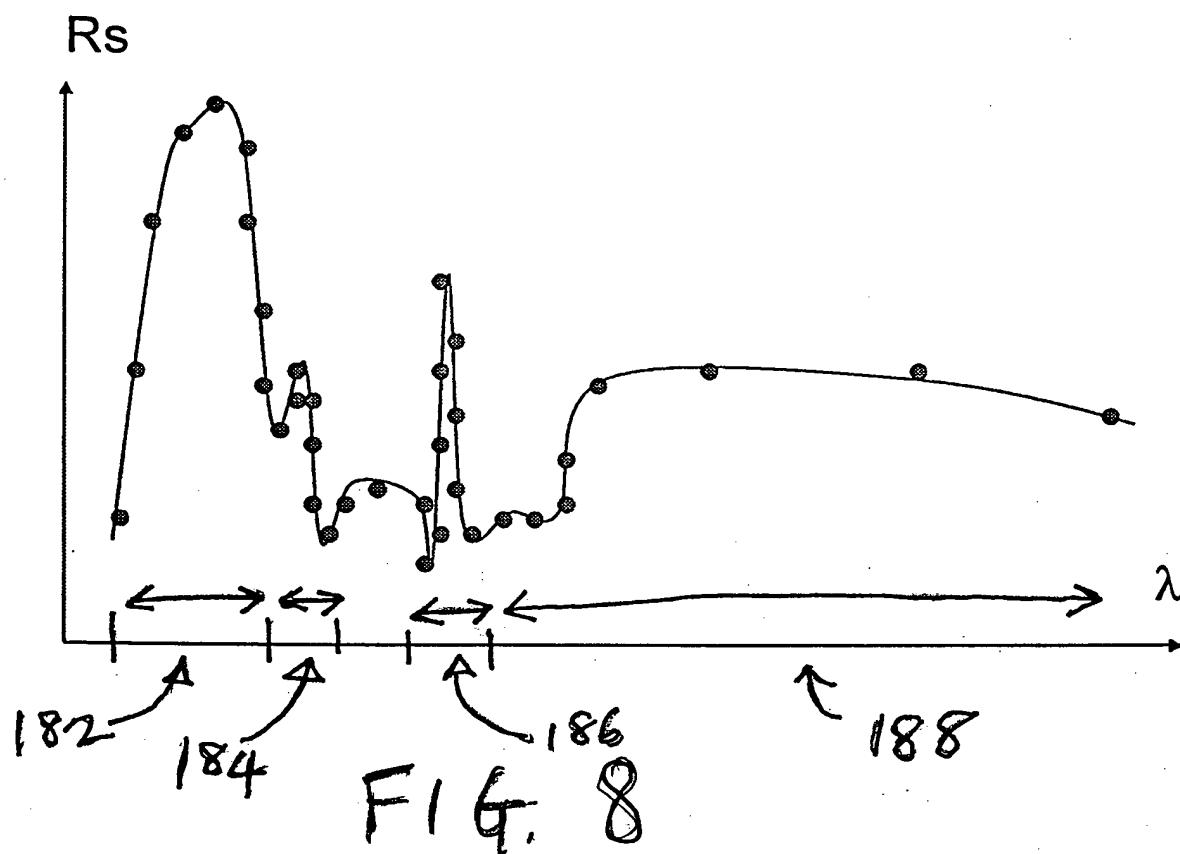# 2. Re-use of grating internal S-matrices

S-matrix is saved after processing most of the slabs

Only the top slab must be re-computed

These slabs are re-usable, including S-matrices

FIG. 6

FIG. 7

Skin depth (nm) vs Wavelength (nm), Poly

Rs

λ

182   184   186   188

FIG. 8

200

200(i)

202

d_y

d_x

200'

200'(1)
200'(2)
200'(3)
200'(4)
200'(5)

FIG. 9

Fig. 2.

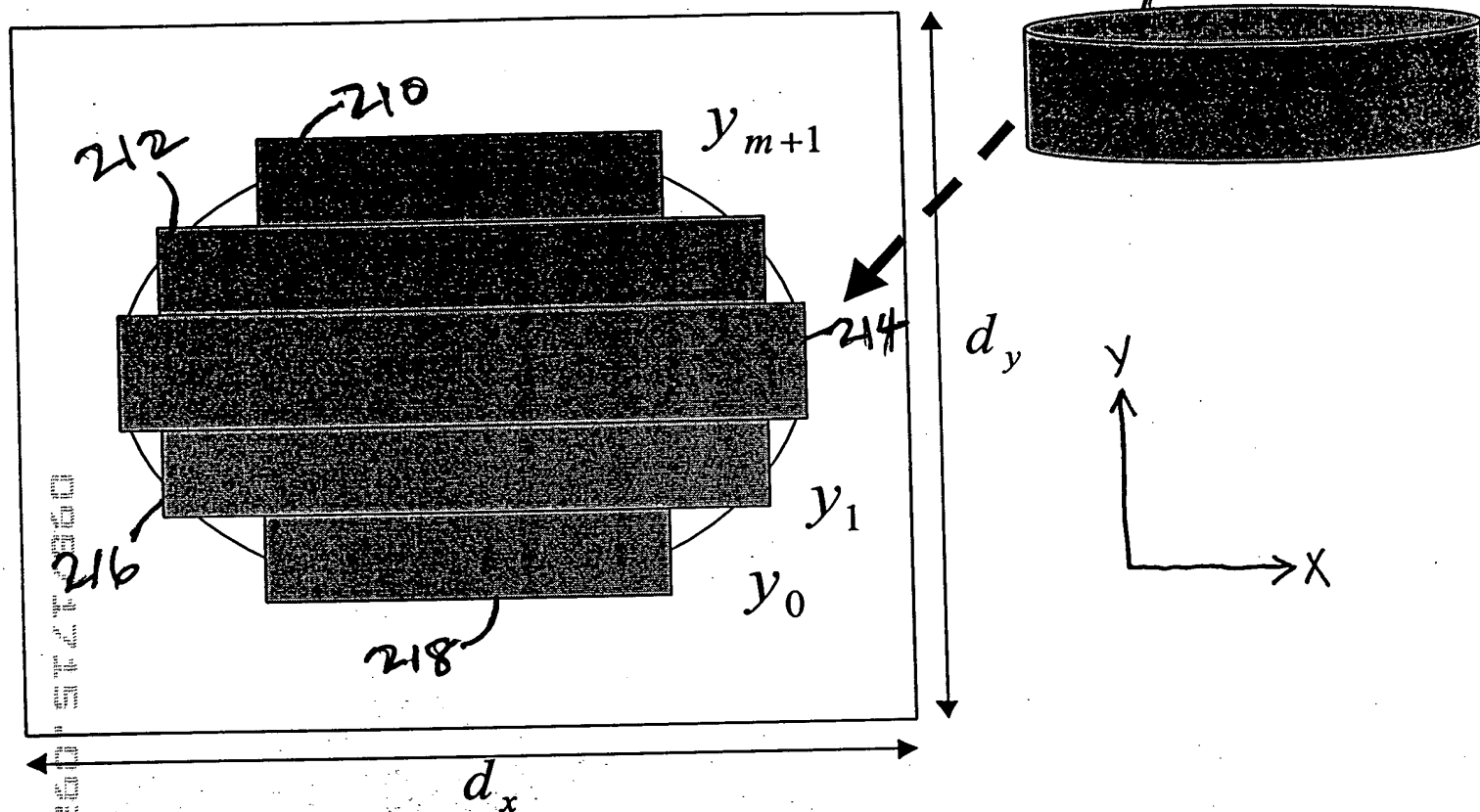$200'(i)$
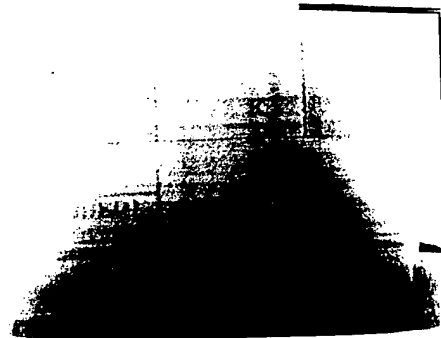
210

212

y_{m+1}

214

d_y

y_1

y_0

216

218

d_x
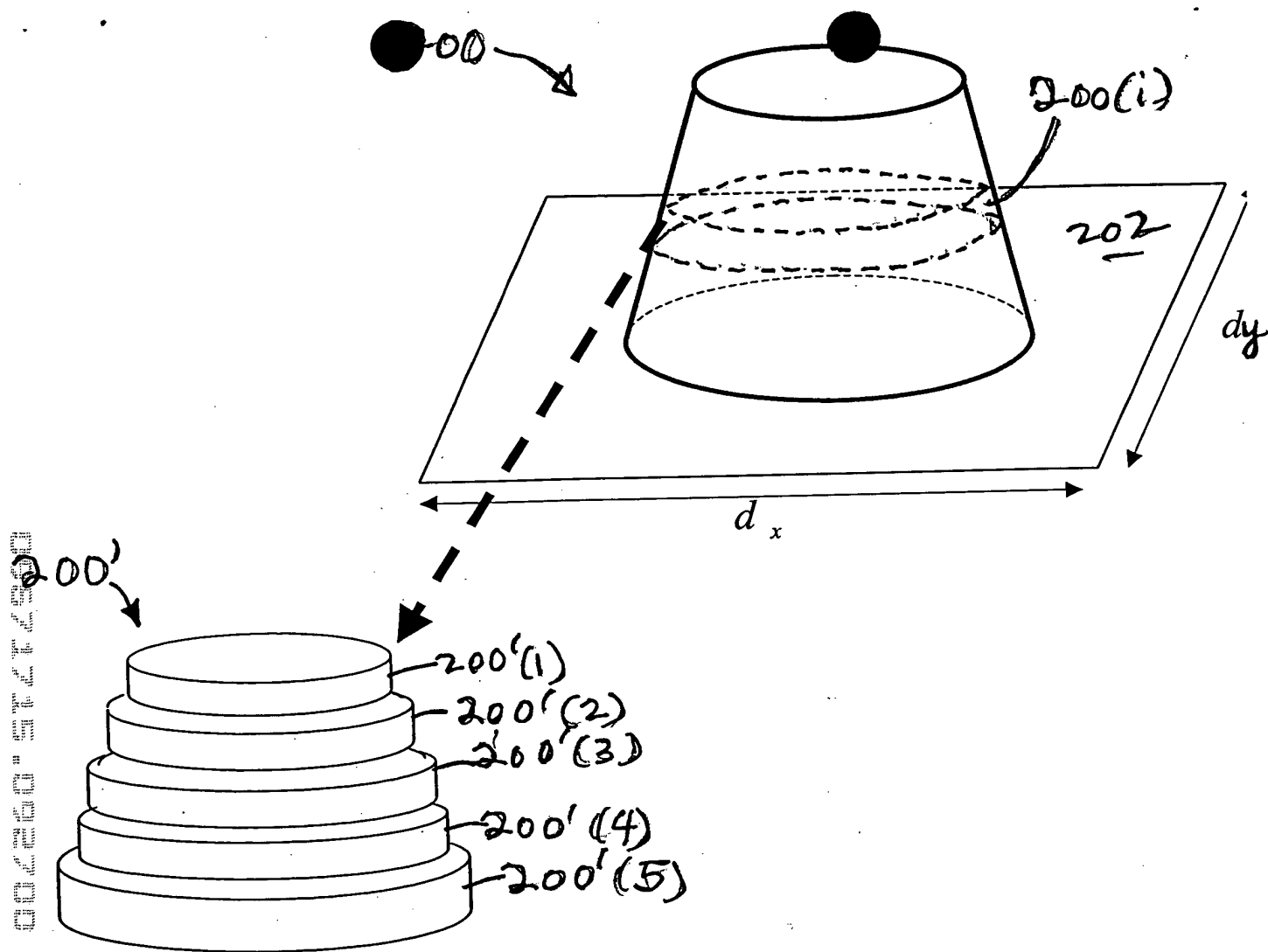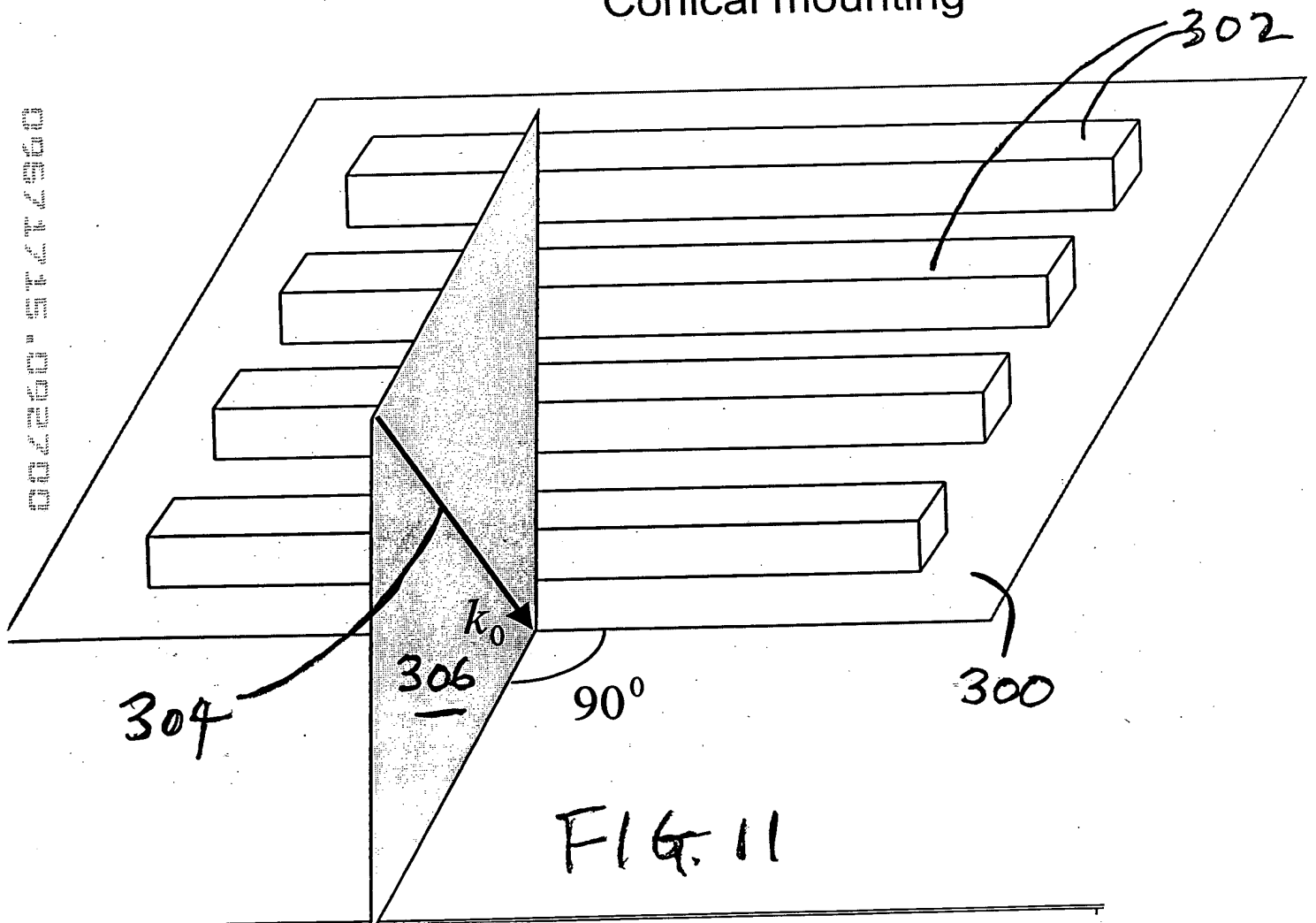
Pseudo-periodic boundary conditions in y-direction:

$$E(x, y_{m+1}) = E(x, y_0)e^{ik_{0y}d_y}$$

FIG. 10

Conical mounting

FIG. 11

10

350   360
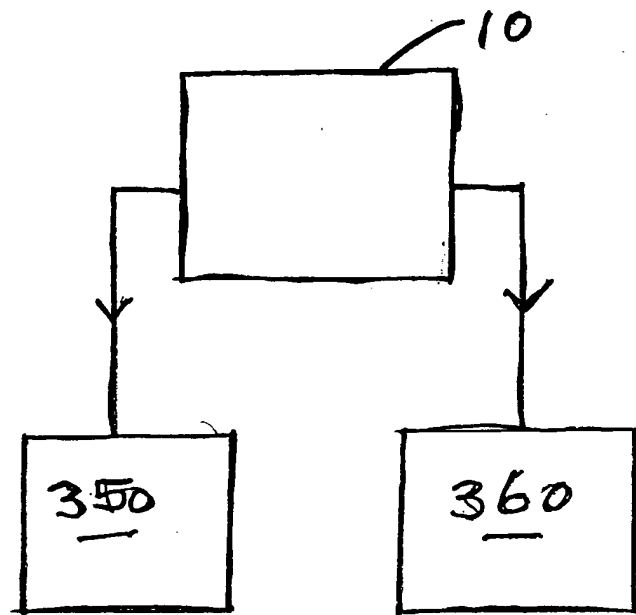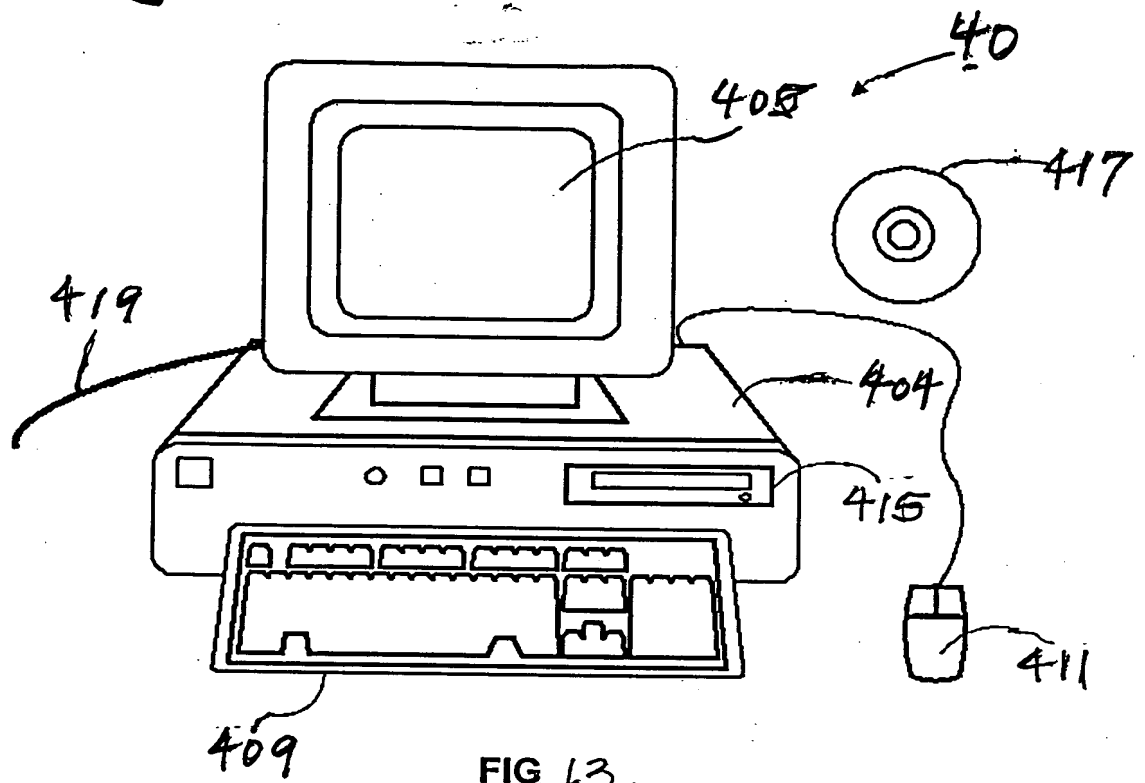
FIG. 12

FIG 13.